M60E3 MACHINE GUN

NOVEMBER 1985

Published for Instructional Purposes Only

EDUCATION CENTER
MARINE CORPS DEVELOPMENT AND EDUCATION COMMAND
QUANTICO, VIRGINIA 22134-5050

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PREFACE

Clearly, the machine gun is an important piece of firepower to our Infantry family. For a number of years the M60 has filled this vital role as the general purpose machine gun for the Infantry Battalion. Today's increasing technology and development has led to improvements to the M60.

The purpose of this publication is to provide information on the M60E3 machine gun and how it differs from the M60. This publication is divided into two chapters. Chapter 1 covers the differences between the M60E3 and the M60. Chapter 2 covers field zeroing of machine guns, and is applicable to the M60, M60E3, and the MK19 machine guns. In 1985 the M60E3 machine gun will replace the M60's found in the Infantry Battalion and select Engineer and Artillery units. Later, the M60E3 machine gun will replace all M60's in the Marine Corps.

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CHAPTER 1

MODIFICATIONS OF THE M60 PRODUCING THE M60E3

SECTION 1: WEIGHT

1101. WEAPON WEIGHT. The M60E3 weighs 18.5 pounds (8.4 kg), which is an improvement on the 23.2 pounds for the M60. This decrease in weight resulted from using lighter materials in the stock group, the trigger housing group, and the forearm assembly. Also, lightweight fiberglass reinforced plastic is being used instead of rubber covered steel.

1102. TOTAL WEIGHT. The total weight of the M60E3 with tripod, pintle, and T&E is 47.9 lbs vice the 56.2 lbs for the M60. This reduction in total weight is due in part to the changes on the barrel (see Section 5 of this chapter) resulting in a 4.6 lb weight reduction.

SECTION 2: FORWARD GRIP ASSEMBLY

1201. GRIP. The M60E3 has a forward grip assembly whereas the M60 has only a forearm assembly (Figure 1-1). The forward grip assembly provides a substantial aid to the machine gunner when using any of the assault firing techniques (Paragraph 2907 of OH 6-9).

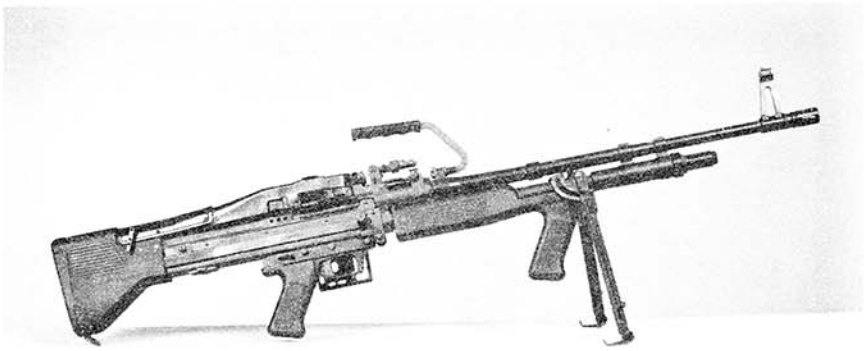


Figure 1-1. — M60E3 Machine Gun.

1202. DISASSEMBLY SCREW. Removing the forward grip assembly of the M60E3 is part of detailed disassembly of the weapon. A screwdriver is used to remove the assembly holding screw, which is located forward of the grip (Figure 1-2). Once the forward grip is removed, the forearm assembly is removed from the receiver.

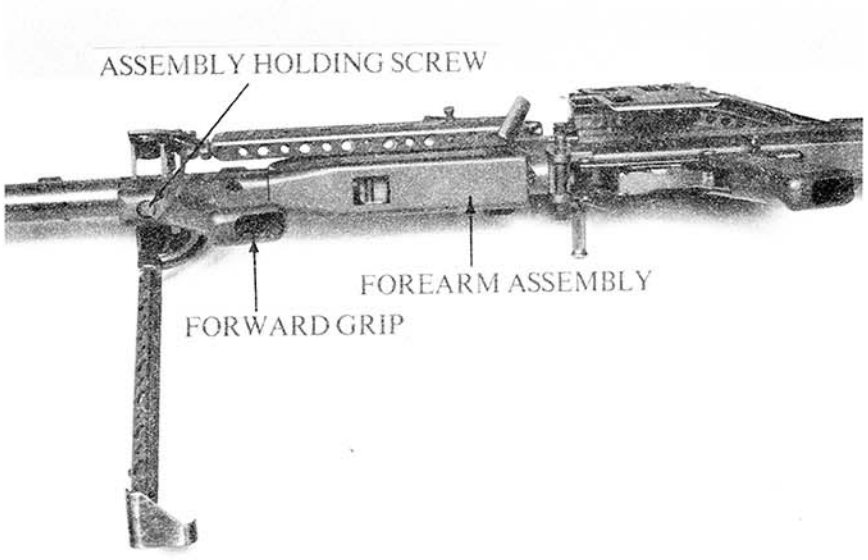


Figure 1-2. — Removing the Forward Grip Assembly.

1203. BIPOD LEGS. After the forward grip assembly has been removed, the bipod legs and forward sling attachment slide off the receiver. More information on the bipod legs can be found in Section 5.

SECTION 3: SIGHTS

1301. APERTURE SIGHT. The sights on the M60E3 incorporate many improvements to those found on the M60. The forward sight is fully adjustable, and the rear sight is an aperture sight vice c- slot sight on the M60.

1302. ELEVATION/WINDAGE. The forward sight is adjustable for both elevation (Figure 1-3) and windage (Figure 1-3A) using the wrench on the combination tool. Adjustments are made to the forward sight only when zeroing both barrels of a machine gun.

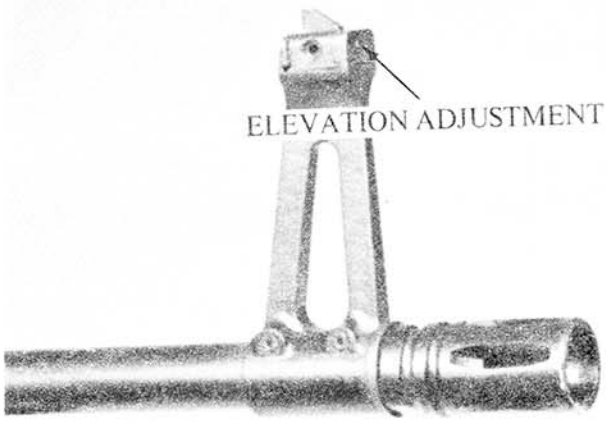


Figure 1-3. — Elevation Adjustment.

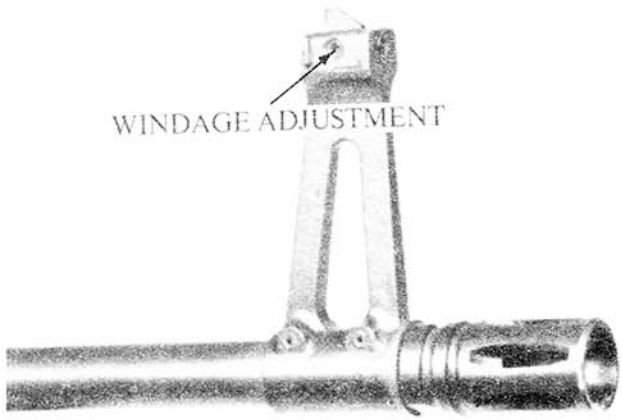


Figure 1-3A. — Windage Adjustment.

1. When the M60E3 is zeroed, the primary barrel is used in the weapon and the rear sight is adjusted (Chapter 2 of this IP). Once the primary barrel is zeroed, and the barrel is changed, the weapon is zeroed again, if time permits.

2. The zeroing of the spare barrel is accomplished like the primary barrel except that the front sight of the spare barrel is adjusted instead of the rear sight. This is covered in greater detail in Chapter 2.

1303. REAR SIGHT. The rear sight on the M60E3 is identical to that found on the M60 except it is an aperture sight instead of a slot sight (Figure 1-4).

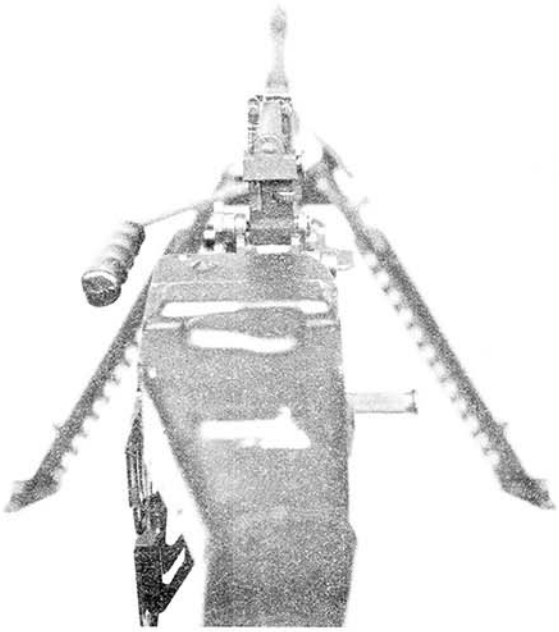


Figure 1-4. — Rear Sight.

SECTION 4: GAS SYSTEM

1401. EXTENSION ASSEMBLY. The gas system on the M60E3 is simpler to maintain than that of the M60. Instead of having a gas cylinder nut, gas port plug, and gas cylinder extension, which are removable, the M60E3 has only an extension assembly which is removable for cleaning (Figure 1-5). The gas piston is also different from the M60's piston.

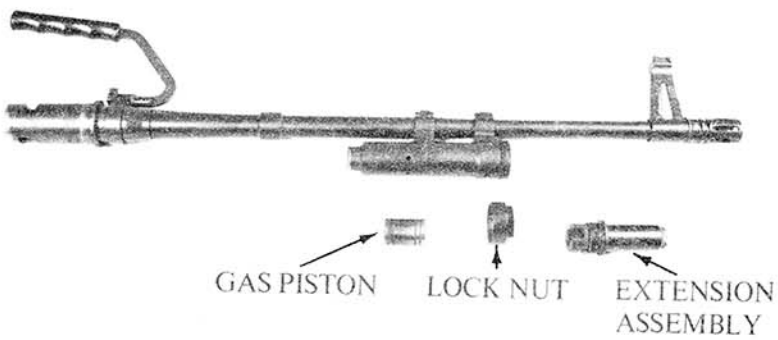


Figure 1-5. — Gas System.

1402. DISASSEMBLY. To detail disassemble the gas system, a combination wrench is used to remove the lock nut. After the lock nut is removed, the extension assembly is unscrewed with a combination wrench.

1403. REAMER. The reamer is used to ream out the gas port through the hole exposed when the extension assembly is removed. Otherwise, cleaning of the M60E3's gas system is identical to the M60.

1404. ASSEMBLY. When assembling the gas system, either end of the gas piston can be put in first. The extension assembly is then screwed on hand-tight, ensuring the flange seats against the gas cylinder (Figure 1-6). The lock nut is screwed on and tightened securely with a combination wrench.

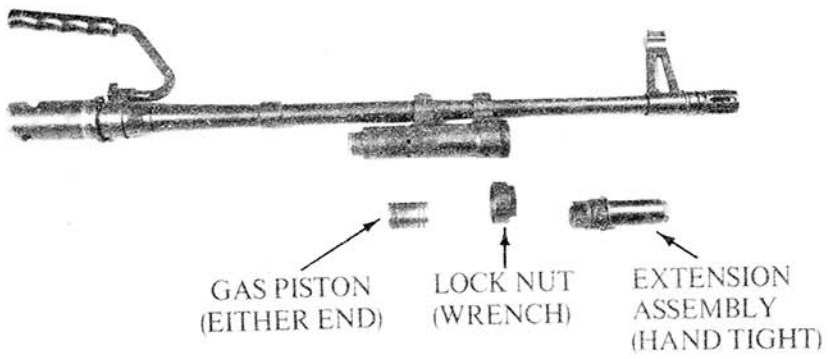


Figure 1-6. — Reassembly of the Gas System.

SECTION 5: CARRYING HANDLE AND BIPOD LEGS

1501. CARRYING HANDLE. On the M60E3, the carrying handle is located on the barrel, and the bipod legs are located on the receiver, as opposed to being on the receiver and barrel respectively — as on the M60.

1502. BARREL CHANGE. The carrying handle is similar to that on the M60 and is attached to the barrel just forward of the barrel socket. This location facilitates changing the M60E3's barrel.

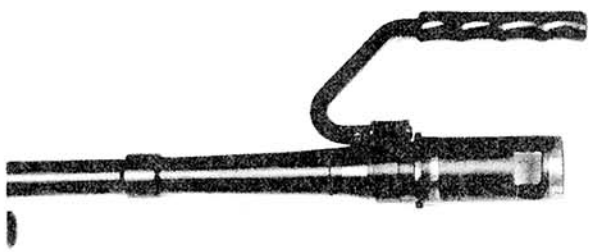


Figure 1-7. — Carrying Handle.

1503. BIPOD LEGS. The bipod legs on the M60E3 are similar to those found on the M249 Squad Automatic Weapon (Figure 1-8).

1. Care must be taken to keep the muzzle and the chamber off the deck during barrel changing procedures. On the M60 the bipod legs keep the muzzle off the deck; that is not the case with the M60E3.

2. Collapsing the bipod legs on the M60E3 is somewhat different from the M60. The gunner must manipulate a latch (Figure 1-8) in order to collapse the legs. Handling the latch is not difficult since the bipod legs do not heat up as rapidly as they do on the M60.

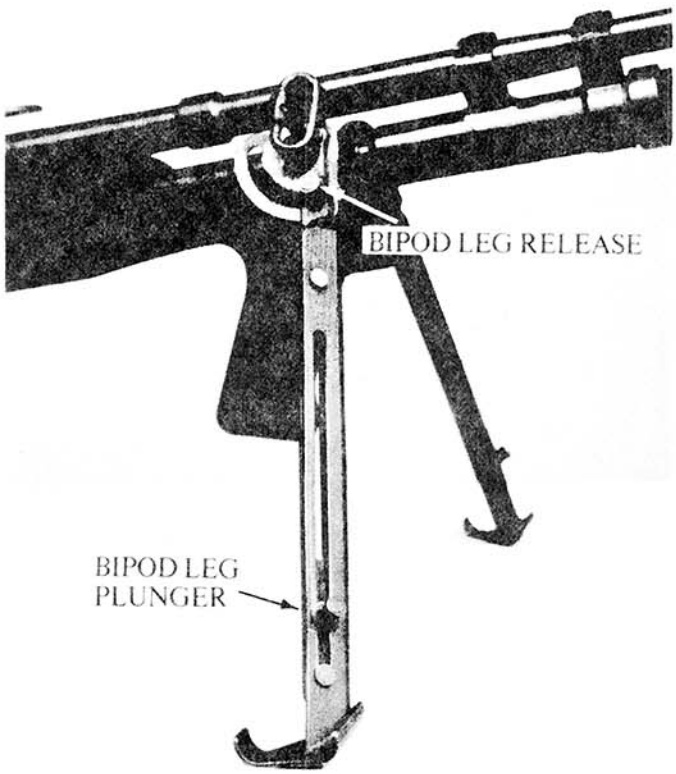


Figure 1-8. — Bipod Legs.

SECTION 6: HINGED SHOULDER REST

1601. SHOULDER REST. The stock group on the M60E3 does not have a hinged shoulder rest. When firing from the prone position with the bipod mount the left hand is placed on top of the cover as with the M60. When firing from a fighting position with the bipod mount, the forward grip assembly is grasped with the left hand to compensate for the lack of a hinged shoulder rest.

1602. RECEIVER DISASSEMBLY. As the M60E3 does not have a hinged shoulder rest, general disassembly of the weapon is changed somewhat.

1. As with the M60, disassembly begins with the weapon cleared: bolt forward, cover raised, weapon on S (safe).

2. To remove the stock and buffer groups on the M60E3, the stock is pushed forward slightly and the buffer yoke is removed from out of the top rear of the receiver, as opposed to removing the stock group by itself.

3. The stock and buffer groups are pulled out of the receiver and separated by lifting the buffer.

1603. ASSEMBLY. Assembly of the M60E3 also differs slightly from the method used with the M60.

1. After the operating group has been replaced, the buffer and stock assemblies are joined by placing the head of the buffer in position in the stock.

2. The stock is placed into the receiver and the buffer yoke is put in position in the receiver.

SECTION 7: COVER

1701. LATCH. A modification has been made to the cover to allow the location of the cover latch to be changed. The cover latch can be removed by unit armorers and reattached to the left side of the weapon to make it easier for a left handed shooter to operate.

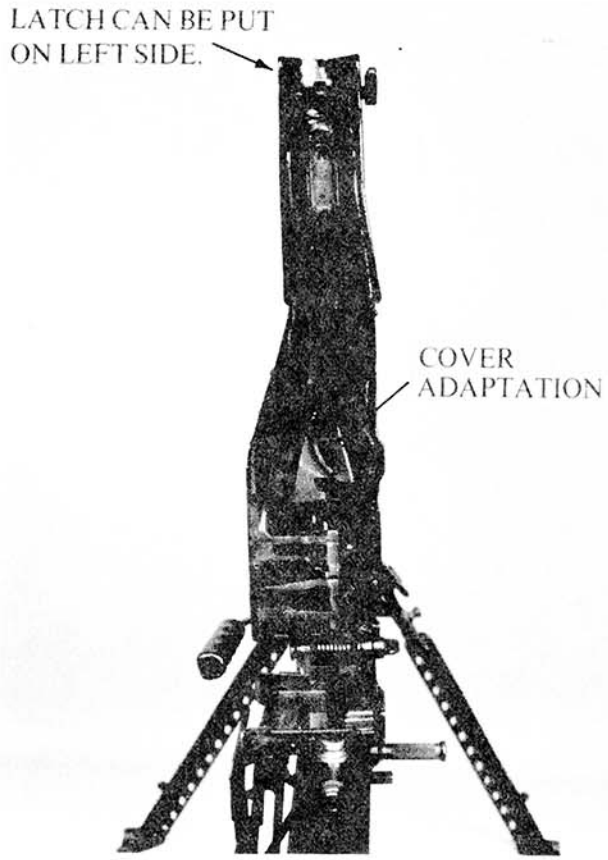


Figure 1-9. — Cover Adaptation.

1702. BOLT. The cover of the M60E3 has also been modified to allow the cover to be closed with the bolt forward. On the M60E3 this will not interfere with the guns operation. Although the modification to the cover allows the cover to be closed with the bolt forward, the preferred position of the bolt, when closing the cover on the M60E3, is to the rear.

SECTION 8: FLASH SUPPRESSOR

1801. FLASH SUPPRESSOR. The flash suppressor on the M60E3 is similar to that on the M16A1. (Figure 1-10).

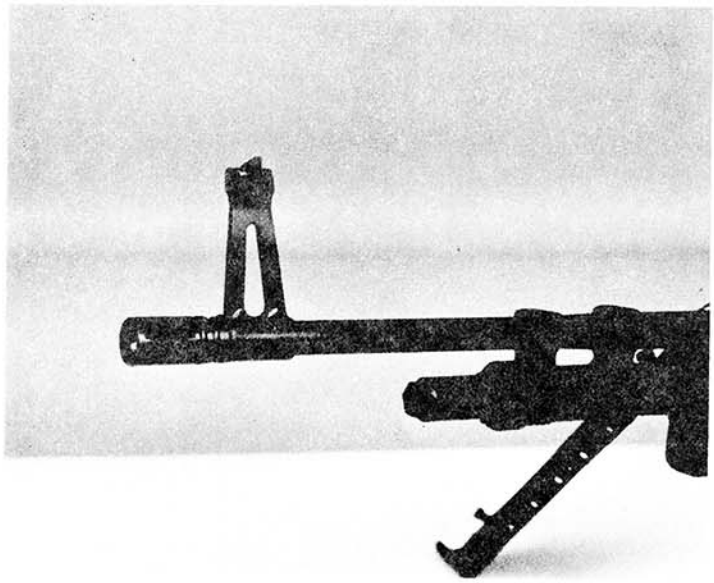


Figure 1-10. — Flash Suppressor.

1802. ADJUSTMENTS. The new style flash suppressor is attached with a wrench and may possibly unscrew itself during firing. A loose flash suppressor can be tightened with the combination wrench. No rotational play is allowed with the M60E3 flash suppressor.

1803. BLANK FIRING ADAPTOR. The M60E3 will also use a different type blank firing adaptor (BFA) that fits inside the flash suppressor.

CAUTION: EXTREME CARE must be taken to ensure that only blanks are fired when the BFA is attached.

SECTION 9: DUAL SIDED SAFETY

1901. SAFETY SWITCH. The safety on the M60E3 can be manipulated from either side of the weapon (Figure 1-11). This change was made to make it easier to manipulate the safety and ensure the weapon is on S (safe). The position of S (safe) and F (fire) remain the same.

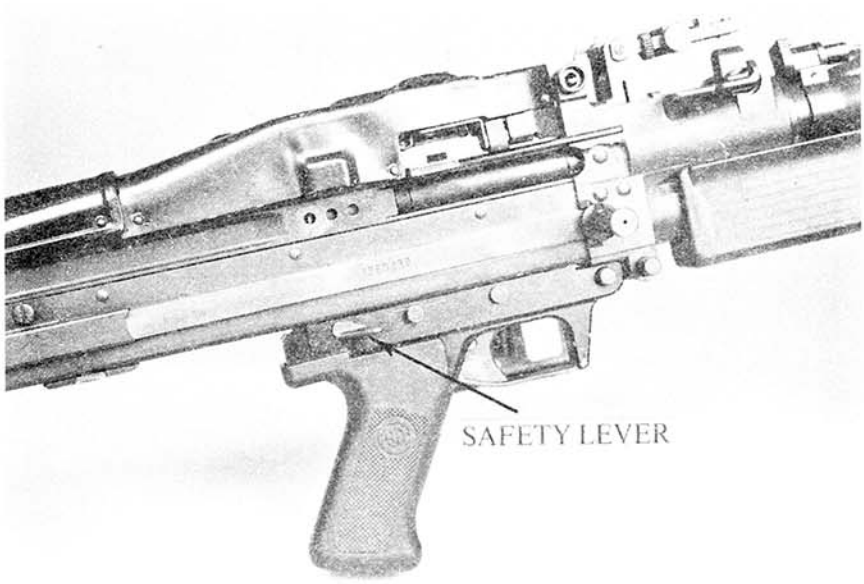


Figure 1-11. — Safety Lever (Right).

Figure 1-11A. — Safety Lever (Left).

SECTION 10: WINTER TRIGGER GUARD

11001. TRIGGER GUARD. The M60E3 has a winter trigger guard, similar to the M16A2's, to allow firing with gloves or mittens on the gunner's hands. The trigger guard on the M60E3 can be rotated down by depressing the spring detent with any round or pointed object (Figure 1-12).

Figure 1-12. — Winter Trigger Guard.

SECTION 11: GENERAL MODIFICATIONS

11101. PLASTIC VICE RUBBER. Many rubber parts on the M60 have been replaced with fiberglass-reinforced plastic on the M60E3. This change reduces the weight of the weapon and increases the life of those parts. The plastic parts, like the rubber on the M60, should not be cleaned using any solvents, such as CLP, RBC, or Dry Cleaning Solvent.

11102. EJECTION PORT. The ejection port on the M60E3 has been lengthened to ensure that rounds are ejected further to the weapons right side. This is an adaptation which makes it easier for a left-handed shooter to operate the weapon.

11103. OPERATING ROD. The M60E3's operating rod has been modified to include an additional sear notch. This notch is designed to reduce the likelihood of a runaway gun.

1. If the gas system is loose or the gun dirty, loss of gas or excessive friction will result in there being insufficient force to drive the operating rod to the rear far enough to engage the primary sear notch. If this is the case, the sear should engage the additional sear notch and stop the weapon.

2. This notch does not totally eliminate the possibility of a runaway gun — it only decreases the likelihood.

3. If the additional notch is engaged by the sear, the cover will not close properly. If this occurs, tighten the gas system and/or clean the gun. To close the cover pull the bolt all the way to the rear.

11104. COMBINATION TOOL. The combination tool for the M60E3 is different from the M60's. The tool has different sized wrenches on it and also has an allen wrench that fits the front sight.

11105. TRIPOD MOUNT. The modifications to the M60E3's safety, cover latch, and ejection port make left-handed firing of the M60E3 from the bipod or assault positions possible. When the M60E3 is tripod mounted, it must be fired with the right hand because the T&E can only be manipulated with the left hand.

SECTION 12: PINTLE

11201. OLD PINTLE. A new pintle is replacing the pintle and platform currently found with the M122 tripod throughout the Marine Corps (Figure 1-13).

11202. NEW PINTLE. The new pintle attaches to the M60 or M60E3 by means of the same mounting pin used to attach the old pintle and platform. Both styles of pintles may be found in a unit until all the old pintle and platforms are replaced by the new pintles.

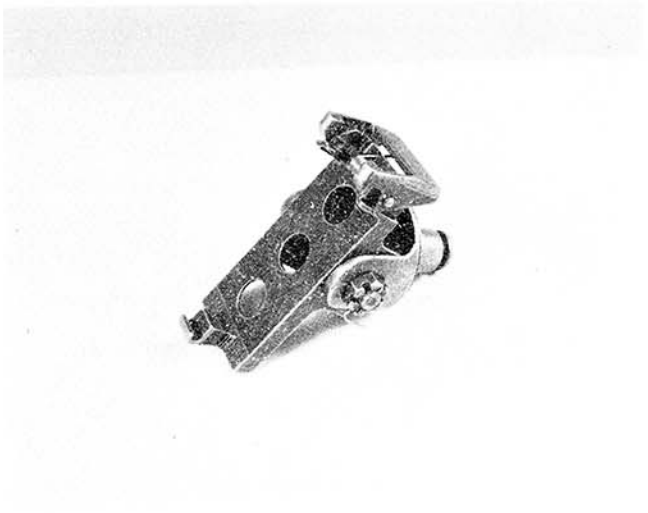


Figure 1-13. — Old Pintle and Platform.

Figure 1-13A. — New Pintle.

CHAPTER 2

FIELD ZEROING

FIGURE

CHAPTER 2

FIELD ZEROING

2001. TYPES OF ZEROING. To ensure that the initial burst of fire inflicts casualties and shocks the enemy, two requirements must be reasonably fulfilled: The range to the target must be estimated accurately, and the guns must be zeroed.

1. Field zeroing and zeroing are processes of adjusting the point of aim to coincide with the strike of the bullets. The sights are manipulated until a good sight picture is obtained on that point on the ground which the bullets strike. In short, a zeroed gun enables you to look and shoot at the same point.

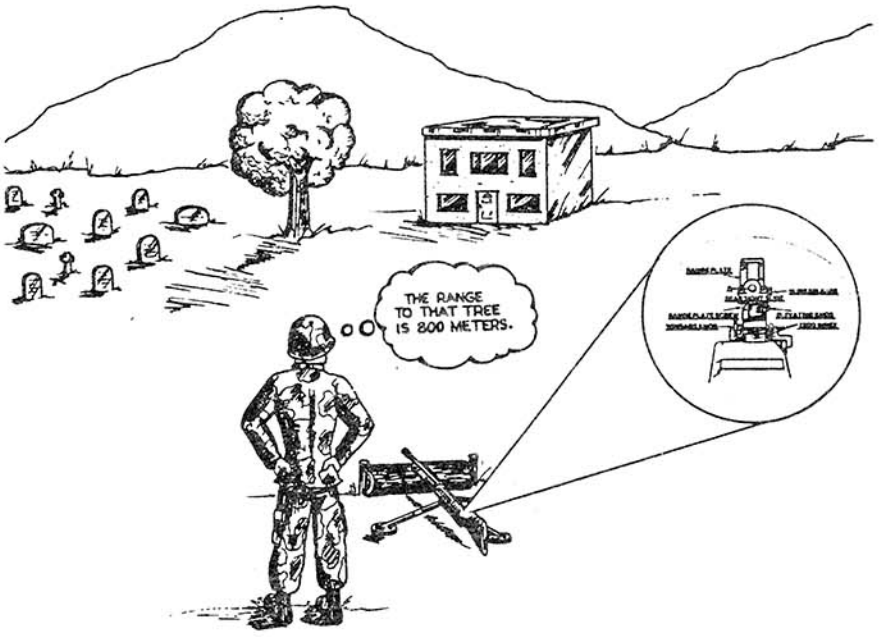
2. A distinction may be made between zeroing and field zeroing. Zeroing is accomplished in rear areas over a known distance range, while field zeroing is simply done while out in the field using an **estimated** range.

3. Since all Marines estimate range differently, the sights are adjusted to correspond to the squad leader's range estimate.

Example: If the squad leader estimates a 750 m. distance to be 800 m., the weapon needs to hit the target when set on a range of 800 m. If it does, the gun is field zeroed to the squad leader's ability to estimate the range. That is, the gun will be on target when set on the squad leader's perceived range, not on the true range.

2002. PROCEDURE. The procedures outlined on the following page describe how to field zero a tripod mounted machine gun. The process of field zeroing a bipod mounted M60E3 is not substantially different.

1. **Initial Sight Setting.** The gunner sets zero windage on the rear sight by manipulating the windage knob. The squad leader estimates the range to a point target and directs the gunner to place this range on his rear sight (Figure 2-1).



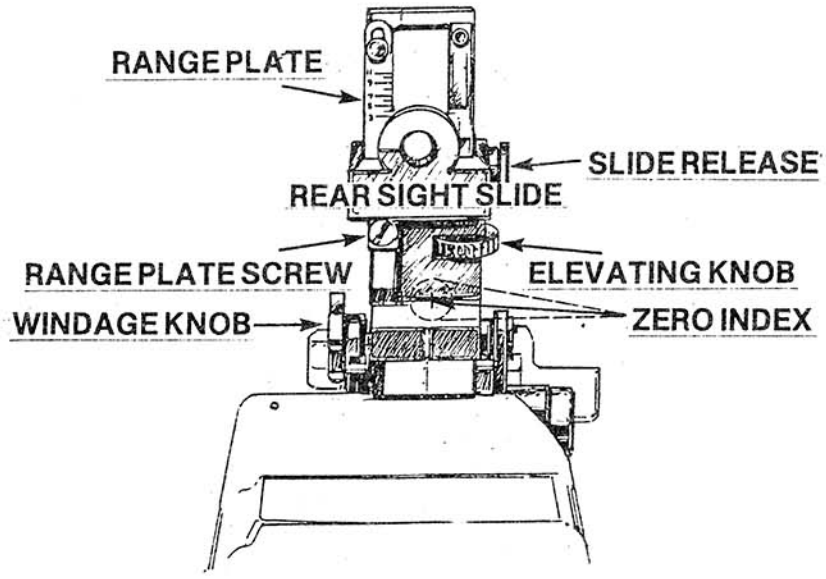


Figure 2-1. — Rear Sight.

Then, the gunner uses his T&E mechanism to lay-in on the target; that is, to obtain a good sight picture (Figure 2-2).

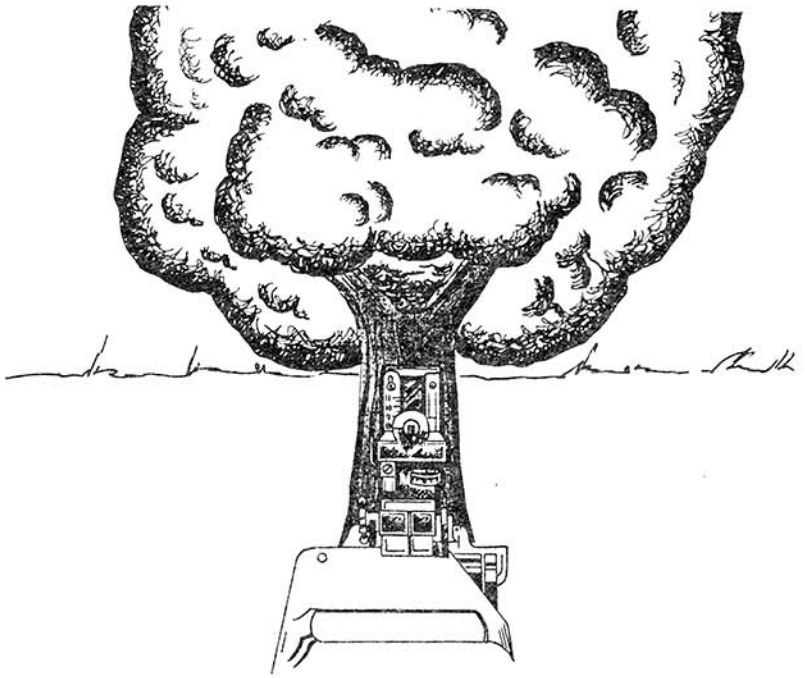


Figure 2-2. — Good Sight Picture.

2. **Fire and Adjust.** The rear sight is lowered, and the gunner fires a burst. Chances are, it will not hit the target — in our example it did not. The team leader spots the gunner's burst and directs the gunner to make adjustments with the T&E and fire again until the target is hit (Figure 2-3).

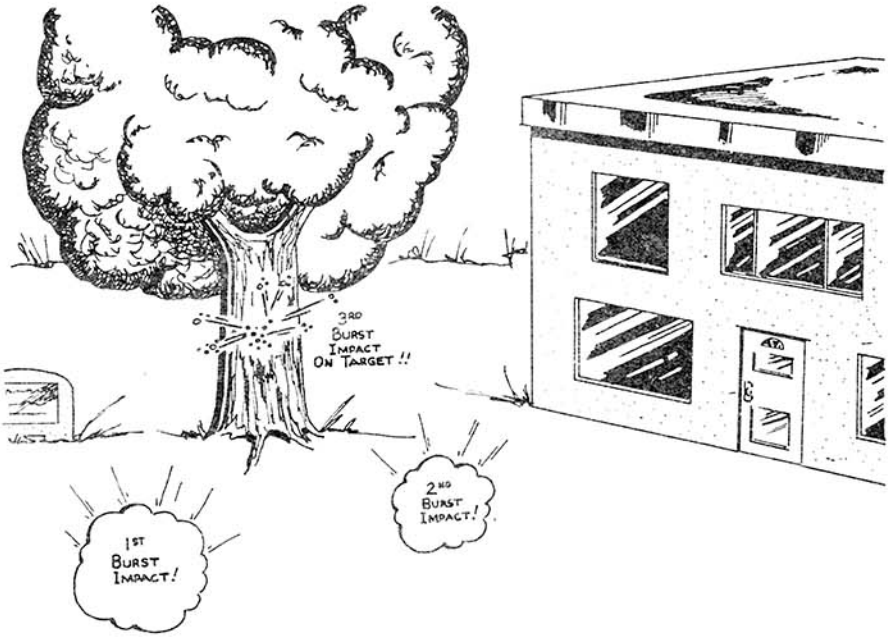


Figure 2-3. — Fire and Adjust.

Example: After the first burst the team leader directs, "RIGHT SEVEN, UP FIVE." After the second burst, "LEFT FOUR, UP EIGHT." The third burst is on the target so we continue with the third step of field zeroing.

3. **Manipulation of the Sight.** The gunner maintains his position and grip on the machine gun, while the team leader raises the rear sight.

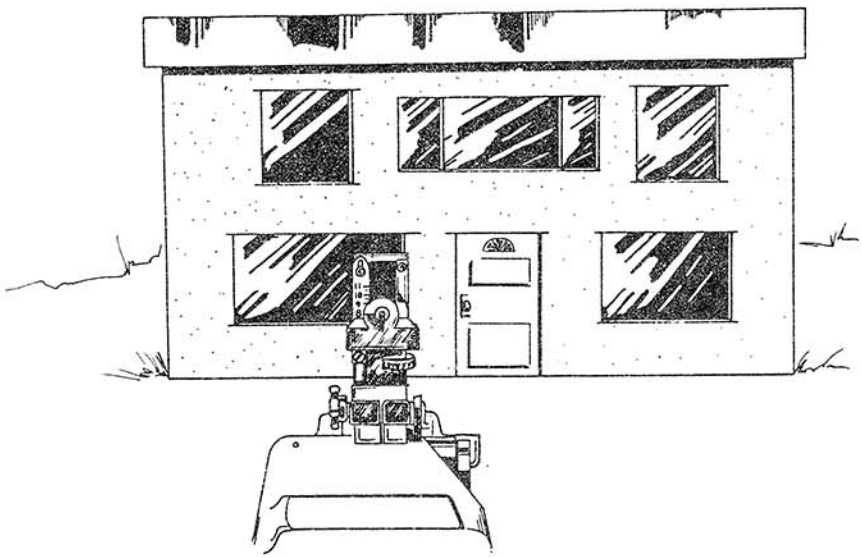


Figure 2-4. — Adjusted Sight Picture.

Notice, in Figure 2-4, that the rear sight is still set on a range of 800, but the sight is not aimed at the target (tree) because the gunner moved the weapon so the rounds hit the target. The gunner directs the team leader to turn the elevation and windage knobs (Figure 2-5) until the gunner again has a good sight picture on the target (Figure 2-6). The gunner does NOT move the T&E mechanism.

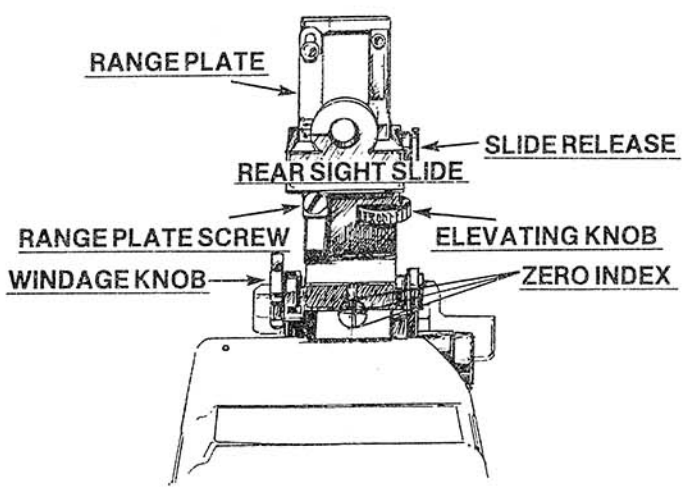


Figure 2-5. — Elevation/Windage Knob.

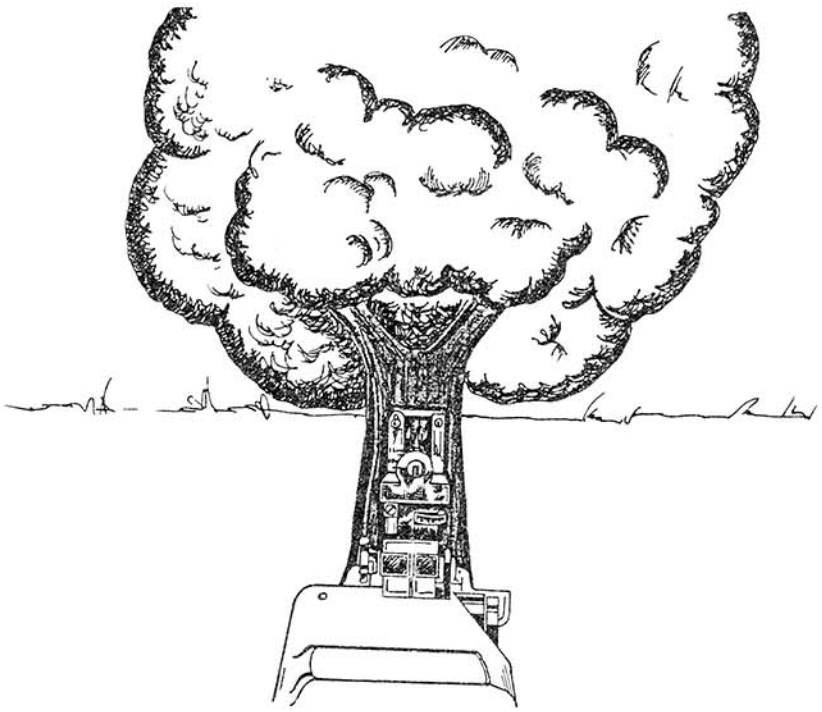


Figure 2-6. — Corrected Sight Picture.

The sight picture is on our target, but notice that the range on the sight is 900 meters instead of the squad leader's estimate range of 800 meters (Figure 2-6). The final step in field zeroing will be to correct this estimate.

4. **Adjustment of the Range Plate.** To correct the range on the range plate on the sight, the team leader loosens the range plate screw (Figure 2-5) and moves the range plate up or down until the original range is on the rear sight (Figure 2-7).

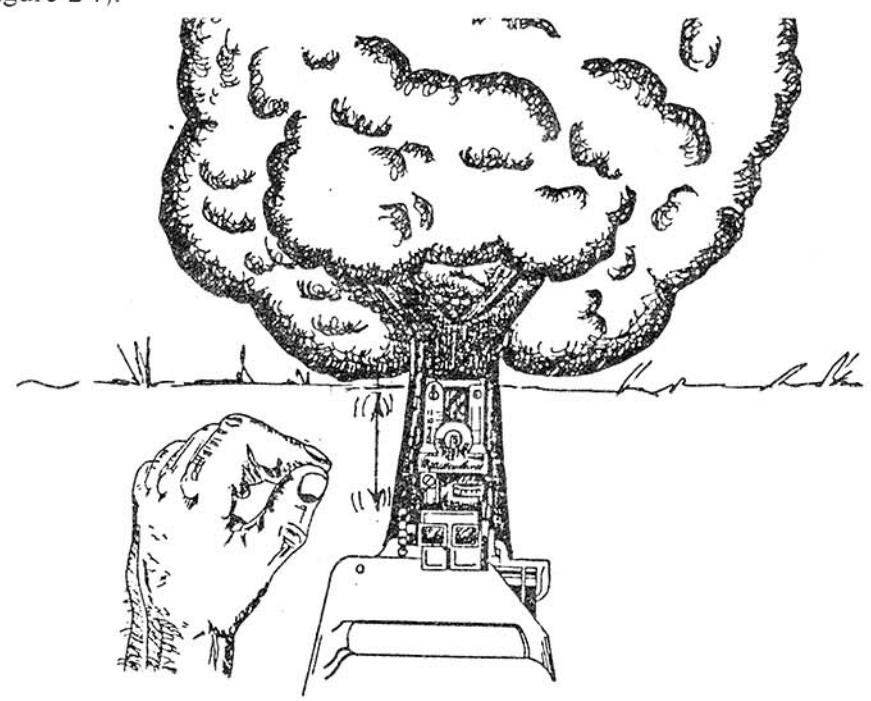


Figure 2-7. — Adjusting Range Plate.

The range plate screw is tightened, and the process is completed. The range on the sight is 800 meters, and the sight is aimed at the target (Figure 2-8).

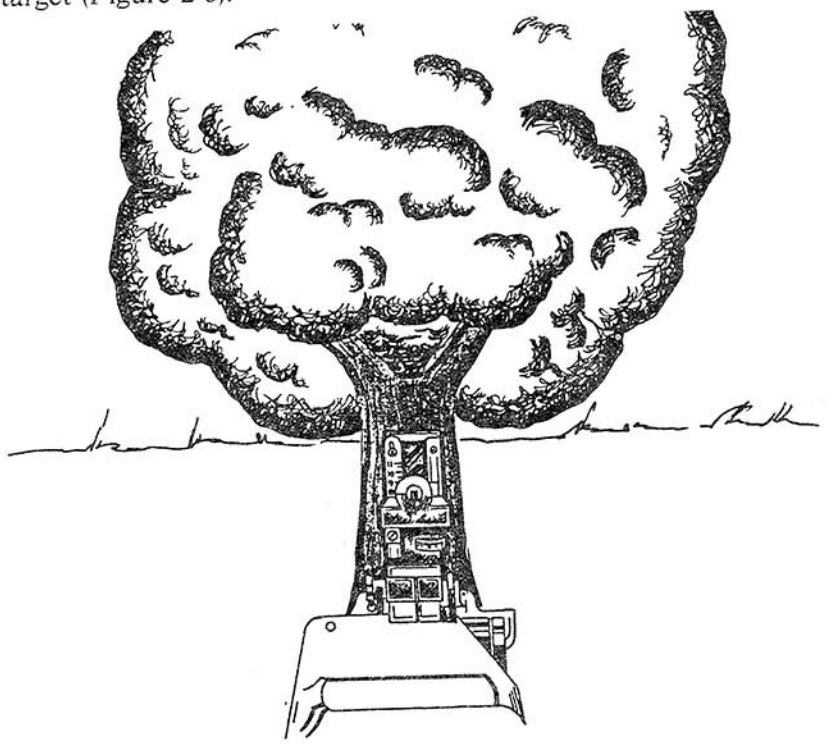


Figure 2-8. — Correct Range/Sight.

(Notice that we have assumed that it is much easier to move the range plate than it is to teach the squad leader how to estimate ranges more accurately. If the squad leader made a slight error in estimating the range during field zeroing, he will more than likely make the same error when estimating the range during combat. A squad leader's guns are field zeroed to coincide with his, and only his, ability to estimate range.)

2003. ZEROING SPARE BARREL. As was covered in Chapter 1, the forward sight on the M60E3 is fully adjustable. When zeroing or field zeroing the M60E3, both barrels should be zeroed, if time permits. Zeroing the barrel in the gun (primary barrel) is accomplished using the method explained in paragraph 2002.

1. To zero the spare barrel, the gunner first zeroes the primary barrel, using the procedures in paragraph 2002, then he changes the barrel. The gunner completes the first two steps of paragraph 2002 with the spare barrel (initial sight setting — fire and adjust).

2. Once the rounds have hit the target, the gunner maintains his position and grip, while the team leader raises the rear sight. Again, the gunner will not have good sight picture, since the weapon was adjusted onto the target. The gunner directs the team leader to manipulate the **front** sight using the combination wrench until the gunner has a good sight picture on the target.

3. Since the rear sight is not manipulated when zeroing the spare barrel, the range plate is not adjusted.

4. Once both barrels have been zeroed, the distinction between primary and spare barrel is not necessary. Both barrels are zeroed and either one can be used with the same effect.